

**AN INTEGRATED OPTICAL CIRCUIT HAVING AN INTEGRATED
ARRAYED WAVEGUIDE GRATING (AWG) AND OPTICAL
AMPLIFIER(S)**

ABSTRACT OF THE DISCLOSURE

5 An integrated optical circuit includes waveguides formed in the integrated
optical circuit. One set of waveguides is a set of optical amplifiers doped with rare
earth ions. A second set of waveguides is a multiplexer or demultiplexer, such as an
arrayed waveguide grating (AWG). The set of optical amplifiers and the AWG are
coupled together via waveguides formed in the integrated optical circuit. Other
10 elements on the integrated optical circuit are coupled to the set of optical amplifiers
and the AWG via optical fibers. The spectral response of the AWG is modified to
compensate for the spectral gain of the AWG. The lengths of the individual optical
amplifiers in the set of optical amplifiers may be varied to cause uniform power
distribution across channels. The integrated optical circuit also has a pump coupler to
couple a pump source to the set of optical amplifiers.